



Fermenting Revolution: Hard Cider Stages a Comeback

Tree Top Heritage Juice Blend Helps Cideries Press On

ARTICLE SUMMARY: Many industries would envy the hard cider industry's double digit sales increases for the last three years and counting. Meeting consumer demand for this popular beverage requires a reliable supply of high-quality apple juice or other fruit juices with the appropriate attributes for cider brewing. Therein lies the problem — market growth has outpaced traditional supply. Tree Top, Inc. has developed its Heritage juice blend specifically for mid-sized cideries looking for a consistent, year-round source of pure quality apple juice, with the tannin content destined to help create a perfect cider.

Twenty, ten or even five years ago a request for hard cider at a local bar or tavern would draw a puzzled response — an odd scenario for what was once the beverage of choice for colonial Americans. At that time people avoided other beverages due to safety concerns and drank cider at mealtime instead. The water supply for instance, wasn't treated and could be the source of virulent diseases. Yet, in the 1840s, hard cider consumption in America all but dried up.

Experts might disagree on the single overriding factor that derailed the American hard cider industry; whether beer displaced it or if temperance delivered the final blow. If beer was the culprit then, today it's the hero.

Cider owes its resurgence, in part, to the proliferation of microbreweries.

Their numbers more than doubled from 2008 to 2014, according to the Brewers Association, and craft beers have taken hard cider along for the ride.

Market Potential

Few industries can boast of double-digit sales increases for not just one year, but three consecutive years and counting. Nielsen reports that hard cider retail sales grew 71 percent in 2014 with the industry

recording production of 52 million gallons.¹ This followed an 89 percent increase in sales in 2013 and a 90 percent leap in 2012. *See fig. 1* "When you compare 52 million gallons to the amount brewed in 2011 and 2012, which averaged around seven to eight million gallons per year, that's monumental," said John Baranowski, Process Research Manager, Operations for Tree Top Inc.

Cider varieties mimic the market for craft beer with consumers able to select and choose the type they like best. Brewers have created all different styles with varying top notes, flavors and mouthfeel. "There are flavors available from ciders that range from something comparable to a Coors Light to a stout or porter equivalent," says Baranowski.

As sales gain momentum, continued market growth is hampered in part by the lack of proper apples or juice concentrate. Apples in both fresh and processed forms are the second most consumed fruit in the U.S. after oranges. However, out of 2,500 varieties grown in the U.S., just 15 accounted for more than 90 percent of production in 2006. Orchards historically devoted acreage to dessert apples rather than the cider variety, which translates into a shortage when it comes to cider stock given its current demand.

And as one person commented in an online forum about brewing, "the worse apples are for eating, the better for making cider." New tree stock for cider varieties can't be planted fast enough, with nurseries reporting orders backlogged to 2018.²

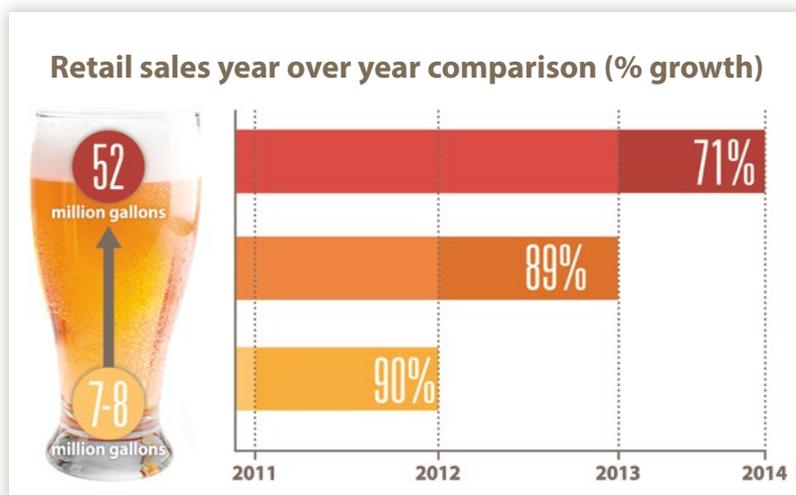


fig. 1

What is Cider?

What we call "hard cider" in the U.S. is simply cider, a fermented form of apple juice. Anything not fermented isn't cider, but juice — even when packaged in rustic jugs sold at a local farm stand — it might simply contain extra solids or sediment.

The Bureau of Alcohol, Tobacco, Firearms and Explosives (ATF) Alcohol and Tobacco Tax and Trade Bureau (TTB) regulate the cider

industry and the legal definition of “cider.” In order to be called cider, the fermented apple juice must supply the sole source of alcohol in the finished beverage and the finished product must contain at least 50 percent juice equivalent. Perry, a similar beverage, must contain a minimum of at least 35 percent pear juice that can be mixed with apple.

The remainder of the cider, or the other 50 percent, can be composed of other liquids or ingredients decided upon by the cidery.

These can include:

- Water
- Sugars (juices, concentrates, sugar, HFCS, honey, maple syrup, brown sugar)
- Non-nutritive sweeteners
- Acids
- Flavors
- Preservatives
- Carbon dioxide

In addition, the finished product must contain alcohol by volume (ABV) of 7.0 percent or less, with carbonation not to exceed 0.392 grams per 100 ml. The FDA governs cider’s labeling requirements, and the finished product must include ingredient and nutritional information. Alcohol content higher than 7.0 percent bumps the beverage into the wine category, which is taxed at a different rate than cider. Also, cideries should note that all of the alcohol content in the finished product must be supplied by the fermented apple juice; none can be added from another source and still have the final product retain the definition of cider.

It’s All About Apple Variety

According to the Cider Advisory Committee decision from the 1950s, cider apples are comprised of four different types: bittersweet — high in tannin and low in acid; bittersharp — high in tannin and high in acid; sharp — low in tannin and high in acid; and sweet — low in tannin and low in acid. *See fig. 2*

The Washington State University Extension site lists bittersweet and bittersharp varieties as a good basis for high-quality, full-bodied ciders. Heirloom and heritage varieties have better characteristics for cider

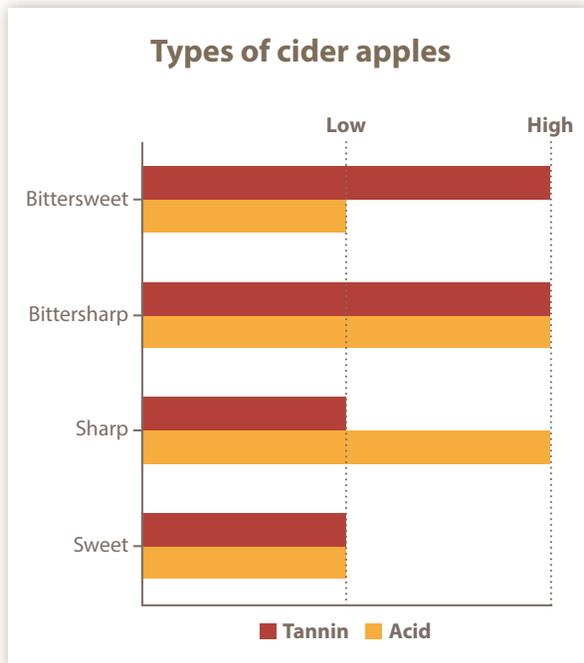


fig. 2

than dessert varieties. Demand for specialty cider apples and the root stock or trees for cider orchards is at a premium, with one grower estimating the wait for new stock to replenish old cider apple trees or establish a new orchard is two to four years.

As Baranowski calculates, if cider needs to contain a minimum 50 percent apple juice, 52 million gallons of cider would require at least 26 million gallons of juice. In the best case scenario, the yield from a ton of apples is 175 gallons of juice, with one acre producing 10 tons of apples on average. This would require 15,000 acres of cider apples and as recently as 2011 there were only 250 acres dedicated to cider apples within the state of Washington. “There are never going to be enough cider apples to keep up with market demand,” says Baranowski.

Tannin is Key

Cider apples or hard cider production relies on the tannin content of the apples or juice concentrates used to start the beverage production. The tannin helps create a cider with layers of flavor and provides its structure. Some small craft cideries will age their product in oak barrels, to further layer the flavor by enhancing tannin content. Crabapples are full of

malic acid and tannins and often are cultivated by orchards interested in cider production.

The typical finished cider in the United Kingdom, for example, posts 1200 to 1500 ppm tannin. The natural apple/pear tannins give a desirable drying effect in the mouth and on the tongue, while added tannins are not as desirable and don't lend the same effect.

The Tree Top Solution

As cider expands from a rural, seasonal tippie to one in demand year-round, traditional cider apples and their subsequent juice will be in increasingly tight supply. In answer to this shortage Tree Top offers its new Heritage-Style Fermenting Juice, a product specifically targeting mid-sized cideries looking for a consistent supply of pure quality apple juice.

Baranowski said, "Our goal was to tailor our process to emphasize the cider notes, the tannins, that a brewer might want for this particular juice stream. This Heritage-Style Fermenting Apple Juice Concentrate emphasizes the right notes to create a hardy cider."

The key to crafting this successful cider juice base is the depth of apple experience and breadth of knowledge of the Tree Top staff. Together Baranowski and his colleague Sue Graf represent the combined experience of 63 years working with apples at Tree Top.

Baranowski and Graf created a blend that starts with dessert apples as the base, but which emphasizes the tannins required for true cider character.

The typical range of traditional apple juice concentrate has a gallic acid equivalent (GAE) of 200 to 450 ppm.

The Heritage-Style Fermenting Juice from Tree Top ranges between 730 to 1000 ppm GAE at single strength-juice value.

Average cider juice, says Baranowski, starts somewhere between 12 and 19 Brix, typically closer to 12, although ranging as high as 19 or 20 if the brewer wants to emphasize flavor notes from certain types of apples. The minimum Brix allowed with reconstituted apple juice concentrate is 11.5 Brix. The cider process can begin with either a concentrated juice base or a single strength base. In either case, the Brix level, or the amount of sugar within the juice, ultimately relates to the alcohol level in the finished product. In simplified terms this can be calculated as $ABV = \text{Brix}/2$. Brewers can raise the Brix level by adding different types of sugar, honey, maple syrup or juice concentrates if necessary. However, the higher the Brix the higher the alcohol content and an ABV above seven percent means the product can no longer be classified as cider. *See fig. 3*

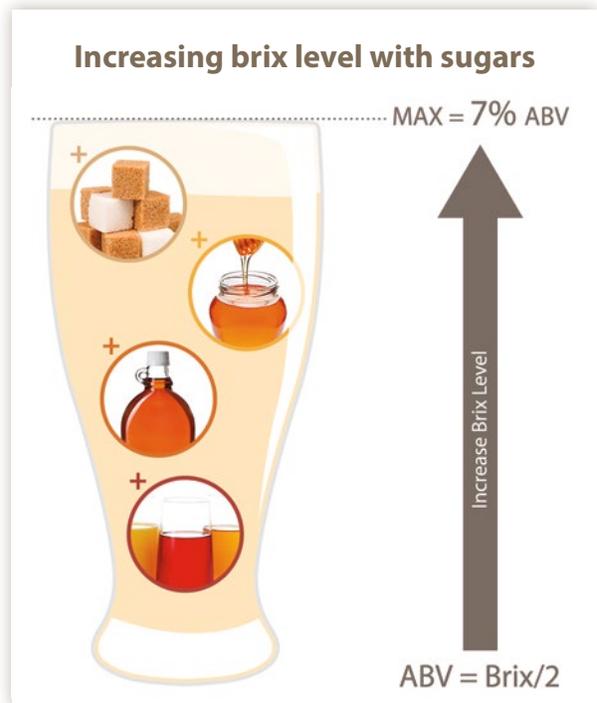


fig. 3

In addition, it means supply is available year round. While some cideries own their own orchards, others are at the mercy of the industry's supply and demand, in addition to the seasonal nature of the crops. The higher the demand for traditional cider apple

varieties, the more the price fluctuates. "With Tree Top the mid-sized cidery can rely on a consistent source of supply for a fair price, instead of paying a premium for cider apples. We can offer economies of scale that make the apple juice or concentrate a viable option for the mid-sized producer," says Baranowski.

In addition, Tree Top sources its apples domestically, from states located in the Northwest region of the country. This means greater quality control over the finished product. "Our clients know they are buying pure juice or concentrate, unadulterated with other substances," says Baranowski, "and with a flood of imported commodity concentrate, this is important for a consistent, quality product."

With Tree Top regulating the tannins, the Brix, pH, microbial count and other key parameters mid-sized cideries can eliminate some of the risk in the supply chain.

A complete analysis of the juice product, including pH, acid, plate counts and microbial specifications is available. "Cideries will add their own strain of yeast for the fermenting process and won't want any competing bacteria," says Baranowski.

If a company requires assistance with its product or processes, Tree Top offers technical support. And for the specialty customer, the company can help with juice characteristics for custom applications.

"The internal qualities of the apple make a huge difference, but it is what a company does to produce the juice, the base for any good cider, that is the determining factor," said Baranowski. "Before the craftsmanship of the individual brewer comes into play and the artistry involved in creating a fine cider, there is the business of finding a consistent supply

of the right juice base. We can provide the business end so the cideries can work their magic."

Heritage-Style Apple Juice from Tree Top is available in 52-gallon sanitized steel drums, packed in a 275-gallon bag-in-bin or an approved, sanitized food grade tanker. Heritage-Style Apple Juice Concentrate can be refrigerated below 45 F for a shelf life of up to 18 months or two years frozen.

Cider Strengths

It isn't beer

Gluten free

Perceived as "natural"

Healthy

Low alcohol content

Approachable

Refreshing

Broad appeal (across gender and age range)

Fruit appeal

Cider Weaknesses

It isn't beer

Lack of defined sales category

Seasonality of consumption (limited availability)

Low alcohol content

References

¹(<http://ciderjournal.com/hard-cider-sales-grows-71-2014/>) accessed April 8, 2015.

²(<http://fruitgrowersnews.com/index.php/magazine/article/hard-cider-new-industry-faces-shortage-of-trees-labor>) accessed April 8, 2015.

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